REJECTIONS UNDER 35 U.S.C. § 112, FIRST PARAGRAPH

Claims 1-4 are rejected under 35 U.S.C.§112, first paragraph since the specification does not provide enablement for other methods of freeze drying. The Examiner says that the claims should require the steps of claim 5 to be commensurate in scope with the specification.

Applicants have amended claim 1 and 2 to include steps recited in claim 5 as suggested by the Examiner. Claims 3 and 4 depend on claim 2 and therefore include the limitations of claim 2.

Accordingly, Applicants submit that Claims 1-4 now satisfy the requirements of Section 112, first paragraph, and request that the rejections be withdrawn.

REJECTIONS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

Claims 3 and 5 are rejected under 35 U.S.C. §112, second paragraph as being indefinite. The Examiner indicates that Claims 3 and 5 are unclear since they contain recitations that lack antecedent basis. Applicants have amended these claims to rectify these problems, and respectfully submit that amended claims 3 and 5 now have proper antecedent basis.

Accordingly, Applicants submit that Claims 3 and 5 now satisfy the requirements of Section 112, second paragraph, and request that the rejections be withdrawn.

REJECTIONS UNDER 35 U.S.C. § 103(a)

Claims 1-6 are rejected under 35 U.S.C.§ 103(a) as being unpatentable over Guschin et al., (1997)(Guschin) in view of Rouchel et al., (1975) (Rouchel(1975)) and Rouchel et al., (1978) (Rouchel(1978)) and Blank et al., (1974) (Blank).

Guschin teaches 3-dimensional gel pad containing microchips that provide greater capacity for immobilization of probes than a 2 -dimensional glass support. Guschin mentions that the oligonucleotide microchips can be dried and kept for months and reused for hybridization i.e., Guschin teaches drying for storage and future use. Guschin does not enable the drying method nor

does it teach or suggest the use of a freeze-drying method to increase the pore size within the polymer to increase the immobilization capacity of the porous polymer pads.

Blank and Rouchel(1975) teach freeze-drying of polyacrylamide gels under conditions that prevent the gel matrix from shrinking during dehydration and provide scanning electron micrographs of the dehydrated gel showing a sponge-like structure.

Rouchel(1978) teaches the technique of freeze-etching a slab gel and observing the pore size of the gels by Transmission Electron Microscopy.

The current invention teaches an improvement of biochip arrays comprising porous polymer pads on solid supports involving freeze drying (enablement found on page 11, lines 20 through page 12, line 3) in order to increase the pore size of the porous polymer pads for enhanced binding of substances like DNA, RNA and polypeptides and for easy diffusion of molecules into the pads during detection.

As the Examiner is aware, a *prima facie* case of obviousness requires some suggestion or motivation, either in the references or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. See M.P.E.P. § 2142.

The Examiner states that it would be *prima facie* obvious to dry the polyacrylamide gel pads of Guschin by freeze drying since Rouchel and Blank suggest that freeze drying can be successfully used to dry a polyacrylamide gel.

However, the Examiner has failed to point out to any teaching in any of the cited references that would motivate one of skill in the art to combine the above references, resulting in the current invention. Applicants respectfully remind the Examiner that "[t]he mere fact that references <u>can</u> be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills,* 16 USPQ2d 1430 (Fed. Cir. 1990); M.P.E.P. § 2143.01. Absent evidence of explicit motivation to combine references, Applicants submit that the Examiner has failed to establish a *prima facie* case of obviousness.

Accordingly, the Applicants submit that claims 1-6 are not obvious over Guschin, Blank, Rouchel (1975) and Rouchel (1978) under Section 103(a), thereby respectfully requesting withdrawal of the rejection.

For all the foregoing reasons, Applicants submit that Claims 1-6 are patentable and respectfully request allowance of the pending claims. Please direct any calls in connection with this application to the undersigned at (415) 781-1989.

Respectfully submitted,
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Dated: August 29, 2001

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APPENDIX OF PENDING CLAIMS
"Version with markings to show changes made"

We claim:

1. (Amended) A method for improving ~~In~~ an array of porous polymer pads on a solid surface, ~~the~~ said improvement comprising:
   a. freezing said array on said solid support and
   b. drying said array on said solid support at reduced pressure,
   wherein ~~freeze drying the array of porous polymer pads to~~ said improvement increases the pore size of the porous polymer.

2. (Amended) An array ~~of~~ comprising:
   porous polymer pads on a solid surface, wherein the porous polymer pads are freeze dried by:
   a. freezing said array on said solid support, and
   b. drying said array on said solid support at reduced pressure,
   ~~and~~ thereby ~~have~~ increasing ~~ed~~ pore size in the porous polymer ~~after freeze drying~~.

3. (Amended) The array of claim 2 wherein a specific binding substance is covalently linked to ~~the~~ said porous polymer pads.

4. The array of claim 3 wherein the specific binding substance is a polynucleotide.

5. (Amended) A method for freeze drying an array ~~of~~ comprising porous polymer pads on a solid support, said method comprising:
   a. freezing said ~~porous polymer~~ array on ~~the~~ said solid support, and
   b. drying said ~~porous polymer~~ array on ~~the~~ said solid support at reduced pressure.

6. The method of claim 5 wherein the porous polymer pads are frozen at liquid nitrogen temperatures and dried under vacuum to remove water by sublimation.